Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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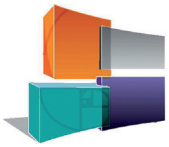

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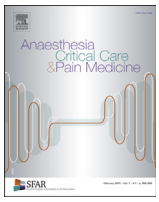

Original Article

Psychological Impact of COVID-19 on ICU Caregivers

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ABSTRACT

Subject and purpose: Just as every pandemic, COVID-19 could lead to emotional and psychological disturbances among caregivers, especially in the Intensive Care Unit (ICU), where significant stress related to the influx of patients, exposure to the virus and the lack of documentation on this new SARS occurred. The present study aimed at assessing the psychological impact of COVID-19 on the caregivers at the peak of the "crisis period".
Materials and methods: A survey using the Hospital Anxiety and Depression Scale (HADS) and Impact of Event Scale – Revised (IES-R) was proposed to the persons working in 5 ICUs of a French teaching hospital (8th of April to the 21st of April 2020). Logistic regression was performed to find independent risk factors for anxiety and post-traumatic stress disorder (PTSD). A value of $p < 0.05$ was considered significant.
Results: The incidence of anxiety and depression were 48% and 16%, respectively. PTSD symptoms were present in 27% of respondents. The independent risk factors for developing anxiety syndrome were being assigned in COVID-19 + ICU (OR = 2.081 [95% confident interval (CI), 1.035-4.184)], and not be trained in intensive care medicine, OR = 2.570 [95% CI, 1.344-4.901]. The independent risk factors for PTSD are having a history of burn-out (OR = 4.591 [95% CI, 1.464-14.397] and not being trained in ICU, (OR = 2.155 [95% CI, 1.047-4.440]).
Conclusion: COVID-19 could have a strong impact on ICU workers. These findings should lead to prevention procedures (ICU training sessions) in persons at risk.

Introduction

At the end of December 2019, the World Health Organization (WHO) is informed of a new outbreak of several cases of pneumonia of unknown aetiology in a Chinese province (1). On the 11th of March 2020, the World Health Organization identified COVID-19 as being a pandemic.

The spread of this new virus, as well as its incidence, rapidly forced a large part of the world's countries to take drastic health measures to protect populations and health systems (1, 2). The emergence of such a pandemic, such as the world has not seen for more than a century, became a public health issue and an international economic challenge. Then, dozens of countries took the decision to quarantine their citizens. Crowded hospitals, lack of equipment, treatment and documentation as well as pharmacological shortages, record-breaking morbidity and mortality led to a global health crisis (3).

Each country, each Hospital Centre took unprecedented measures in order to be able to accommodate the massive influx of patients. The Intensive Care Units (ICUs) were heavily impacted. In France, deferring and postponing a large part of the surgical activity allowed to double ICU bed capacity from 5,000 to 10,000 in two weeks. Moreover, the available anaesthetic staff could be helpful for these new ICU beds. Professionals must be trained quickly to be operational as soon as possible. All these conditions and changes in professional and personal life could likely impacts the team psychological well-being (4).

The health care teams have an increased risk of developing psychological disorders during a pandemic such as anxiety, depression, PTSD, anger, fear, guilt, irritability, frustration, and sleep disturbance (5).

Moreover, working in the ICU is already a source of stress. Indeed, caregivers face death, family distress, end of life, physical

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and psychological suffering, handling complex therapeutics, sophisticated technical means, etc. (6).

Mealer et al. (7) had already demonstrated a few years earlier that ICU nurses were more likely to develop PTSD compared to non-ICU nurses.

The context of the international health crisis brings many risk factors that can affect the psychological well-being of our caregivers, which is why we must pay special attention to them.

The aim of our study was to assess the psychological impact of coronavirus on the entire ICU team.

Method

Ethics Committee Agreement

This study has obtained the agreement of the ethics committee of Nimes (ref 20.0026). No written informed consent was required (8). The authors guarantee the anonymisation of all data collected.

Main objective

The main objective was to analyse the psychological impact (anxiety, depression and PTSD) of COVID-19 on ICU staff.

Questionnaire with data collection

We developed a survey made of one file with four sub-parts:

1) Characteristics related to the caregiver and the way in which he/she is confined.
2) All information concerning his or her professional career.
3) Questions concerning the working conditions related to COVID-19.
4) Two scales: HADS and IES-R were proposed (9, 10).

Surveys were distributed in the department between the 8th of April and the 21st of April 2020, when the influx of patients was the highest in Lyon. The entire ICU team was invited to fill it out: doctors, nurses, orderlies, students, reinforcements, etc. Once the surveys were completed, we proceeded to computer data entry.

Inclusion criteria were to work in the ICU and to be volunteer to complete the survey. The non-inclusion criteria were to refuse to participate in the study. There was a 95% completion rate.

Scales used

We used the Hospital Anxiety and Depression Scale (HADS), (10) a validated scale for the evaluation of anxiety and depressive symptomatology and severity of symptoms. The scale has 14 items, 7 assess anxiety and 7 assess depression. All questions have 4 responses, all coded from 0 to 3. The score ranges go from 0 to 42. For interpretation purposes, the scores for the anxiety questions (1-3-5-7-9-11-13) and the depression questions (2-4-6-8-10-12-14) must be added together to obtain 2 scores that are then added together.

- From 0 to 7: absence of anxiety and depressive disorders
- From 8 to 10: suspected anxiety or depressive disorders
- From 11 to 21: proven anxiety or depressive disorders

The thresholds for the overall score are:

- From 0 to 14: no anxiety-depressive syndrome
- From 15 to 42: Existence of anxiety-depressive syndrome

We used the IES-R Validated scale to assess Post Traumatic Stress Disorder (11). PTSD is a severe or chronic psychological disorder due to a traumatic event and characterised by nightmares, flashbacks, sleep disorders and hypervigilance, which is responsible of many social and personal disturbance (12). The scale is composed of 22 items, each statement must be marked with a number between 0 and 4. Items are subdivided into three categories: revivification, avoidance and hyper activation. The scores of all the items are then added together. Final score is between 0 and 88.

- From 0 to 32: mild symptoms
- From 33 and more: moderate and severe symptoms

Statistical analysis of the data

Once the surveys were completed, we proceeded to data anonymisation. For statistical analysis, qualitative data are expressed in absolute numbers (%) and quantitative data are expressed as an average ± SD or median (IQR) depending on their distribution. Quantitative data are compared by a Student *t* test or a Mann-Whitney test; qualitative data are compared by a chi-2 test or an exact Fisher test (SASJMP14). We used logistic regression to find independent risk factors for anxiety and post-traumatic stress. A value of $p < 0.05$ was considered significant.

Results

Cohort description

Two hundred and eight people completed the surveys (156 females, 75%). One hundred and eight (52%) have no kid. (Table 1) In the 100 remaining, 18 (18%) reported difficulties with childcare. The "typical" profile of the confined caregiver is as follows: confined with two or more people (104 cases, 50%), for 193 (93%) people, the usual home is the place of confinement, 91 (44%) health care workers live in a house with an outside and 90 (44%) are between 6 and 15 km from their workplace. Twenty-eight were physicians (13%) and 84 were nurses (41%). The cohort includes 27 (13%) students who came to help during the crisis. One hundred and five (63%) professionals have less than 10 years' qualifications and 81 (48%) have less than one year's experience in ICU. Many of the caregivers (47/43%) had no experience in ICU. In Lyon's university hospitals, COVID-19 positive patients were in specific units. Moreover, 49 professionals (24%) and 46 professionals (22%) have increased their alcohol and tobacco consumption respectively during the peak of the coronavirus outbreak. Concerning COVID-19: 142 (73%) professionals were assigned to COVID-19 + ICU Unit, 162 (78%) of the caregivers have already managed a contaminated patient. Professionals rate their level of training in a personal and subjective way, 61 professionals (34%) of the cohort do not consider themselves sufficiently trained to work in intensive care.

The results concerning the depression and anxiety-depressive syndrome was not significative in statistical analysis, so, it will not be shown.

Table 2 shows responder characteristics associated with more anxiety. Being a woman, > 35 years old, having an history of burn-out syndrome, working in a COVID-19 unit, feeling enough trained for working in the ICU were associated with more anxiety. Being anxious was also associated with more depression and more PTSD.

Caregivers with anxiety had lower self-esteem than the rest of the cohort 29.5 [26.75-35] *vs* 34 [30-38] ($p < .001$). Caregivers

Table 1
Clinical characteristics of the full cohort.

		Full cohort n = 208
Characteristics		
Sex		
	Woman (%)	156 (75)
Age		
	< 35 years (%)	127 (61)
Working Life		
Profession		
	Nurse anaesthetist (%)	15 (7.5)
	Care assistant (%)	41 (20)
	Surface technician (%)	6 (3)
	Anaesthesia nurse student (%)	1 (0.5)
	Nurse student (%)	12 (6)
	Medical student (%)	8 (4)
	Nurse (%)	84 (41)
	Intern (%)	11 (5)
	Physiotherapist (%)	5 (2)
	Physician (%)	17 (8)
	Secretary (%)	4 (2)
Students		
	Yes (%)	27 (13)
Graduation year		
	Less than 10 years (%)	112 (63)
	More than 10 years (%)	32 (18)
	More than 20 years (%)	34 (19)
Comes to ICU voluntarily (n = 105)		
	Yes (%)	75 (71)
Burn-out		
	Yes (%)	20 (10)
COVID-19 parameters		
Works in a COVID-19 unit		
	Yes (%)	150 (73)
Working conditions		
Feels enough trained to work in ICU		
	Yes (%)	119 (66)

suffering from anxiety are also more physically and psychologically tired.

After logistic regression, the independent risk factors for developing anxiety syndrome were being assigned in COVID-19 + ICU, OR = 2.081 (95% CI, 1.035-4.184), $p = 0.04$ and not being trained in intensive care medicine, OR = 2.570 (95% CI, 1.344-4.901), $p = 0.003$.

Table 3 shows responder characteristics associated with PTSD. Being over 35 years old, having an history of burn-out syndrome, not felt trained enough to work in ICU were associated with PTSD. After logistic regression, the independent risk factors for PTSD are having a history of burn-out (OR = 4.591 (95% CI, 1.464-14.397), $p < .001$ and not being trained in resuscitation, (OR = 2.155 (95% CI, 1.047-4.440), $p = 0.04$.

There is an association between the fear of being contaminated and caregivers that suffer from PTSD. Among them, 39 professionals (38%) were afraid of becoming a carrier where 12 persons (13%) have no such concerns ($p < .001$). Caregivers with PTSD have lowered self-esteem 30 [26.25-34.75] *vs* 33 [29-37] ($p = 0.04$). They are also more tired physically and psychologically.

Discussion

The incidence of anxiety was very high, 48%, the incidence of depression was at 16%, and 27% of caregivers had PTSD symptoms. The independent risk factors for developing anxiety syndrome were being assigned in COVID-19 + ICU, and not be trained in intensive care medicine. The independent risk factors for PTSD are having a history of burn-out and not being trained in resuscitation.

Classically, 13% of ICU professionals are anxious and 4% are depressed (13). Excluding COVID-19, 11% of ICU nurses suffer from PTSD (14). The present study confirms the findings of different studies reported during the COVID-19 outbreak in Asia. J Z Huang, in China (15), shows that 23.04% of doctors in contact with the virus are anxious, and anxiety is higher among women, and among nurses. The same is true for PTSD. The professionals exposed to the coronavirus also suffer from depression (50%) and anxiety (44.6%). The risk factors were being a woman, a nurse, a front-line caregiver and being between 26 and 40 years old. Exposure to the virus has also been shown to be a risk factor as well as experience (16). A study carried out in Wuhan on the level of anxiety, shows that by having volunteer staff come to work in contact with COVID-19 patients and by having trained this staff beforehand, the level of anxiety is much lower than in other articles in the literature (17).

A study conducted in Singapore during the epidemic found that 15.4% of staff in contact with COVID-19 were anxious, 10.6% were depressed and 7.4% of staff had PTSD. Risk factors include being a female, having co-morbidities, and being an elderly person (15).

All these studies report a strong psychological impact of COVID-19 on caregivers. Risk profiles remain similar, even between different countries and/or services. The conclusion is also similar between the different studies: upstream training seems to be the most promising solution.

The emergence and global spread of coronavirus have marked the beginning of the year 2020 (1). COVID-19 is a unique, rapidly spreading pandemic with the risk of severe complications, and persons suffering from co-morbidities as well as young people may be severely affected. Lack of documentation and treatment is a major stressor (5).

Table 2
Clinical characteristics according to the anxiety status.

Parameters		Cohort	Non-anxious n = 107	Anxious n = 98	*P* value
Characteristics					
Sex		205			**0.03**
	Women (%)	153	73 (48)	80 (52)	
	Man (%)	52	34 (65)	18 (35)	
Age		205			< **.001**
	< 35 years	125	95 (76)	30 (24)	
	> 35 years	80	13 (16)	67 (84)	
Working Life					
Profession		201			0.483
	Nurse anaesthetist (%)	15	9 (60)	6 (40)	
	Care assistant (%)	40	22 (55)	18 (45)	
	Surface technician (%)	6	4 (67)	2 (33)	
	Anaesthesia nurse student (%)	1	1 (100)	0 (0)	
	Nurse student (%)	11	6 (55)	5 (45)	
	Medical student (%)	8	5 (62.5)	3 (37.5)	
	Nurse (%)	83	37 (45)	46 (55)	
	Intern (%)	11	9 (82)	2 (18)	
	Physiotherapist (%)	5	2 (40)	3 (60)	
	Physician (%)	17	10 (59)	7 (41)	
	Secretary (%)	4	1 (25)	3 (50)	
Students		205			0.174
	Yes (%)	27	18 (65)	9 (35)	
	No (%)	178	91 (51)	87 (49)	
Graduation year		176			0.807
	Less than 10 years (%)	111	58 (52)	53 (48)	
	More than 10 years (%)	31	17 (55)	14 (45)	
	More than 20 years (%)	34	16 (47)	18 (53)	
Burn-out history		203			**0.010**
	No (%)	183	101 (55)	82 (45)	
	Yes (%)	20	5 (25)	15 (75)	
COVID-19 parameters					
Works in a COVID-19 unit		204			**0.037**
	No (%)	56	36 (64)	20 (36)	
	Yes (%)	148	71 (48)	77 (52)	
Working conditions					
Feels enough trained to work in ICU		178			**0.003**
	No (%)	61	22 (36)	39 (64)	
	Yes (%)	117	70 (60)	47 (40)	
COVID-19 psychological impact					
HADS					
	Depression [IQR]	205	2 [1–4]	5.5 [3-8.25]	< **.001**
	Total HADS [IQR]	205	8 [5–10]	16 [13-19.25]	< **.001**

The ICUs have most often treated patients with a critical and acute form of coronavirus with initial high mortality rate. Moreover, the daily lives of ICU caregivers have been rapidly disrupted. The challenge for ICUs has been to increase significantly and rapidly the number of beds available to handle the large influx of patients. In order to increase the number of intensive care beds in France from 5,000 to 10,000, it was necessary to postpone all non-emergency surgical procedures. Most of the operating theatre personnel who were not working were subsequently trained by the ICU teams. These decisions allowed to double, sometimes triple the ICU bed capacity. However, some shortages of equipment and drugs occurred. These conditions associated with the general confinement and distance with family could stressed out the personnel leading to major psychological impact on caregivers, as reported in the present study.

During a natural disaster or an epidemic, previous studies have shown that professionals tend to sacrifice their own needs in order to take care of patients and provide assistance (18). The emergency and health crisis undermine the emotional and psychological well-being of caregivers. They are on the front line and exposed to the virus almost continuously. The growing influx of patients and the intensity of the working days lead to feelings of helplessness, isolation and physical and mental stress (18). All caregivers, regardless of their original service and/or the service to which they were assigned during this health crisis, were exposed to the same psychological risks: fear for being a carrier of the virus and put their family, friends or colleagues at risk, and fear of dying. Under these conditions, a feeling of uncertainty prevailed as well as a feeling of stigmatisation (16).

Being a working professional during COVID-19 involves enormous pressure such as being exposed to a risky environment, presenting symptoms of physical and psychological stress that can impact general well-being. Caregivers are particularly concerned about contracting the virus and spreading it to others (16).

Front-line health care workers are directly involved in the diagnosis, treatment, and care of COVID-19 patients (16). For the first time, many professionals were putting their health, and sometimes their lives, at stake in order to fulfil their duty as caregivers (17).

Prior to COVID-19, the recommendations during pandemic times were as follows: give staff access to psychological assistance, support groups, and regular updating of knowledge about the pandemic (5). The psychological consequences of this pandemic should lead us to question the need to offer personalised and psychological care to caregivers (18). The present study clearly shows that informing ICU caregivers about the COVID-19 outbreak (mode of transmission, prevention procedure) could decrease the associated stress. Therefore, managers must be vigilant while dealing with professionals who are prone to psychological disorders discussed above. Moreover, training and/or retraining

Table 3
Clinical characteristics according to the PTSD status.

Parameters		Cohort	No PTSD n = 143	PTSD + n = 52	*P* value
Characteristics					
Sex		195			0.185
	Women (%)	144	102 (71)	42 (29)	
	Men (%)	51	41 (80)	10 (20)	
Age		205			**0.015**
	< 35 years (%)	125	100 (80)	25 (20)	
	> 35 years (%)	80	50 (63)	30 (37)	
Working life					
Profession		192			0.789
	Nurse anaesthetist (%)	15	10 (63)	5 (37)	
	Care assistant (%)	40	31 (77.5)	9 (22.5)	
	Surface technician (%)	6	5 (83)	1 (17)	
	Anaesthesia nurse student (%)	1	0 (0)	1 (1)	
	Nurse student (%)	10	8 (80)	2 (20)	
	Medical student (%)	7	6 (86)	1 (14)	
	Nurse (%)	78	57 (73)	21 (27)	
	Intern (%)	10	8 (80)	2 (20)	
	Physiotherapist (%)	5	3 (60)	2 (40)	
	Physician (%)	16	11 (69)	5 (31)	
	Secretary (%)	4	2 (50)	2 (50)	
Graduation year		168			0.585
	Less than 10 years (%)	105	75 (71)	30 (29)	
	More than 10 years (%)	31	24 (77)	7 (23)	
	More than 20 years (%)	32	21 (66)	11 (34)	
Burn-out history		194			< **.001**
	No (%)	176	135 (77)	41 (23)	
	Yes (%)	18	7 (39)	11 (31)	
COVID-19 parameters					
Works in a COVID-19 unit		195			0.254
	No (%)	53	42 (79)	11 (21)	
	Yes (%)	142	101 (71)	41 (29)	
Working condition					
Feels enough trained to work in ICU		170			**0.035**
	No (%)	59	38 (64)	21 (36)	
	Yes (%)	111	88 (79)	23 (21)	

should be considered to prevent psychological repercussions on teams during a new health crisis or a traumatic event.

The present study has some limitations.

- The COVID-19 impact study was carried out exclusively in Lyon in the same hospital. There was 1 non-COVID-19 unit and 4 COVID-19 units. However, the cohort includes all the professionals of the units. The surveys were performed at the peak of the pandemic, which allowed a high response rate (95%).
- The IES-R is usually used for a short-time traumatic event and not immediately done right after the event. For instance, those events are likely to occur after car accidents. The scale yet can be considered less suitable for outbreaks such as COVID-19. Indeed, the traumatic event has a longer duration in time. However, we wanted to have the PTSD results during the crisis to have reference data in case of a second remote coronavirus data collection.

In clinical practice, the present study shows that COVID-19 has a strong impact on the psychological well-being of caregivers. Health managers must be vigilant with people presenting a risk profile. Offering training and retraining for staff could be a solution to limit the psychological repercussions of this crisis.

Ethics Committee Agreement

This study has obtained the agreement of the ethics committee of Nimes, the authors guarantee the anonymisation of all data collected.

Disclosure of interest

None.

Funding

None.

References

[1] Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature 2020;579(7798):270–3.
[2] Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ, et al. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak - an update on the status. Mil Med Res 2020;7(1):11.
[3] Pung R, Chiew CJ, Young BE, Chin S, Chen MI, Clapham HE, et al. Investigation of three clusters of COVID-19 in Singapore: implications for surveillance and response measures. Lancet 2020;395(10229):1039–46.
[4] Chew NWS, Lee GKH, Tan BYQ, Jing M, Goh Y, Ngiam NJH, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. Brain Behav Immun 2020.
[5] Chew QH, Wei KC, Vasoo S, Chua HC, Sim K. Narrative synthesis of psychological and coping responses towards emerging infectious disease outbreaks in the general population: practical considerations for the COVID-19 pandemic. Singapore Med J 2020.
[6] Laurent A, Capellier G. Stress professionnel en médecine intensive réanimation, de quoi parle-t-on? Méd Intensive Réa 2018;27(1):75–9.
[7] Mealer M, Burnham EL, Goode CJ, Rothbaum B, Moss M. The prevalence and impact of post traumatic stress disorder and burnout syndrome in nurses. Depress Anxiety 2009;26(12):1118–26.
[8] Toulouse E, Masseguin C, Lafont B, McGurk G, Harbonn A, Roberts JA, et al. French legal approach to clinical research. Anaesth Crit Care Pain Med 2018;37(6):607–14.
[9] Chiasson M, Lapierre S, Balbinotti MAA, Desjardins S, Vasiliadis HM. Validation de contenu de la version francophone du questionnaire Impact of Event Scale-Revised selon les critères du DSM-5. Pratiques Psychologiques 2018;24(1):21–34.

[10] Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67(6):361–70.
[11] Creamer M, Bell R, Failla S. Psychometric properties of the Impact of Event Scale - Revised. Behav Res Ther 2003;41(12):1489–96.
[12] Ursano RJ, Bell C, Eth S, Friedman M, Norwood A, Pfefferbaum B, et al. Practice guideline for the treatment of patients with acute stress disorder and post-traumatic stress disorder. Am J Psychiatry 2004;161(11 Suppl):3–31.
[13] Colville GA, Smith JG, Brierley J, Citron K, Nguru NM, Shaunak PD, et al. Coping With Staff Burnout and Work-Related Posttraumatic Stress in Intensive Care. Pediatr Crit Care Med 2017;18(7):e267–2e73.
[14] Costa DK, Moss M. The Cost of Caring: Emotion, Burnout, and Psychological Distress in Critical Care Clinicians. Ann Am Thorac Soc 2018;15(7):787–90.
[15] Huang JZ, Han MF, Luo TD, Ren AK, Zhou XP. [Mental health survey of medical staff in a tertiary infectious disease hospital for COVID-19]. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi 2020;38(3):192–5.
[16] Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Netw Open 2020;3(3):e203976.
[17] Mo Y, Deng L, Zhang L, Lang Q, Liao C, Wang N, et al. Work stress among Chinese nurses to support Wuhan for fighting against the COVID-19 epidemic. J Nurs Manag 2020.
[18] Sun N, Wei L, Shi S, Jiao D, Song R, Ma L, et al. A qualitative study on the psychological experience of caregivers of COVID-19 patients. Am J Infect Control 2020.